

REMARKS

Applicants respectfully request reconsideration of this application as amended. Claims 1-12 and 44-51 are pending in the application. Claims 1, 8, and 11 have been amended. New claims 44-51 have been added. Support for the amended and new claims can be found in specifications on page 10, lines 5-8, 14-15, page 11, lines 16-17, page 14, line 8 to page 15, line 2, page 15, line 21 to page 16, line 2, page 23, lines 2-4, and page 31, line 1.

Response to Double Patenting

Claims 1, 3, 4, 5, 6, 8, 9, 10 and 11 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3 and 4 of U.S. Patent No. 6,746,826. In light of the amendment, the Examiner's rejections have become moot. Nonetheless, the following remarks regarding the Examiner's rejections and the amended claims may be helpful to expedite prosecution.

U.S. Patent No. 6,746,826 fails to claim the limitation of applying a charge of developer fluid onto a polymer layer on a substrate at a **plurality of locations** on the surface of the polymer layer.

Applicant, accordingly, respectfully requests withdrawal of the rejection of claims 1, 3-6, and 8-11 under the judicially created doctrine of obvious-type double patenting as being unpatentable over U.S. Patent No. 6,746,826.

Claim Rejections - 35 U.S.C. § 103

Claims 1-12 are rejected under 35 USC 103(a) as being unpatentable over Shibata et al. (U.S. Patent No. 5,897,982) hereinafter "*Shibata*", considered in view of Sakai et al. (U.S. Patent No. 5,853,961) hereinafter "*Sakai*". In light of the amendment, the Examiner's rejections have become moot. Nonetheless, the following remarks regarding the Examiner's rejections and the amended claims may be helpful to expedite prosecution.

Applicant's invention relates to a method for minimizing precipitation of developing reactant by lowering a sudden change in pH, comprising: applying a charge of developer fluid onto a polymer layer on a substrate at a **plurality of locations** on the surface of the polymer layer; developing at least a portion of the polymer layer; then permitting at least a portion of said charge of developer fluid to dwell on said polymer so as to **controllably minimize** a subsequent sudden **change in pH**; and then rinsing said polymer with a charge of another fluid; wherein the developer fluid and the other fluid for rinsing are applied with a **low impinging force**; and providing a **laminar airflow field** in a developer fluid module in which said substrate is located. Further, an embodiment relates to applying a charge of a first developer fluid having a **first developer fluid chemistry** onto a polymer layer on a substrate; developing at least a portion of the polymer layer; then rinsing said polymer with a charge of a second developer fluid having a **second developer fluid chemistry** so as to **controllably minimize** a subsequent sudden **change in pH**; wherein the first developer fluid chemistry and the second developer fluid chemistry are **different**; and then rinsing said polymer with a charge of a rinse fluid having a fluid chemistry **different** than either the first or second developer fluids; wherein the charge of the first and second developer fluids dispensed onto

the polymer layer are applied at a **plurality of locations** on the surface of the polymer layer; and providing a **laminar airflow field** in a developer fluid module in which said substrate is located.

Applicants have recognized that by controllably minimizing a subsequent **change in pH** the precipitation of developing reactants is also minimized. Furthermore, Applicants have recognized that applying developer fluid at a **plurality of locations** facilitates control of the change of pH. When a developer is first applied to the polymer layer, the developer has just started to react with the polymer and thus the pH of the developer has only changed slightly, thus the developer is unlikely to precipitate reactants. However, as the developer migrates to other locations, its reaction with the new locations changes the pH and increases the risk of precipitation. In contrast, the application of developer in a plurality of locations, provides fresh developer to a plurality of locations and reduces the need for the same developer to react with many other locations, thus minimizing the change in pH, and thus minimizing the precipitation of developing reactants.

In addition, applying fluid at a plurality of location permits the **total** fluid flow to the substrate to be **much higher**, thus reducing the processing time of the developing process. Further, since the fluids are applied to a plurality of locations, the fluid flow at each location is reduced, which also reduces the **impinging force** of the fluid onto the polymer layer, thus reducing the risk of damage to the patterned polymer structure.

Similarly, the use of a **second developer fluid** with a **different chemistry** provides the potential to adjust the developer chemistry of the first developer fluid as it ages with usage. The second developer fluid may have a pH, which when mixed with the remaining

aged first fluid, refreshes the fluid to minimize the change in pH, and thus reducing the risk of precipitation.

Further, the use of a laminar **airflow** field helps keep contaminants, such as the splatter of fluids from the developing process, from contacting the substrate surface.

In contrast, *Shibata* fails to disclose or suggest applying a charge of developer fluid onto a polymer layer on a substrate at a **plurality of locations** on the surface of the polymer layer; to **controllably minimize** a subsequent sudden **change in pH**; wherein the developer fluid and the other fluid for rinsing are applied with a **low impinging force**; and providing a **laminar airflow field** in a developer fluid module in which said substrate is located. Further, *Shibata* fails to disclose or suggest applying a charge of a first developer fluid having a **first developer fluid chemistry** onto a polymer layer on a substrate; then rinsing said polymer with a charge of a second developer fluid having a **second developer fluid chemistry** so as to **controllably minimize** a subsequent sudden **change in pH**; wherein the first developer fluid chemistry and the second developer fluid chemistry are **different**; and then rinsing said polymer with a charge of a rinse fluid having a fluid chemistry **different** than either the first or second developer fluids; wherein the charge of the first and second developer fluids dispensed onto the polymer layer are applied at a **plurality of locations** on the surface of the polymer layer; and providing a **laminar airflow field** in a developer fluid module in which said substrate is located.

Sakai is introduced to disclose the use of a laminar **airflow** field, but fails to disclose or suggest that limitation as well as all the limitations discussed above, and thus fails to remedy all the deficiencies of *Shibata*. *Sakai* appears to only disclose a **laminar** flow of

developer fluid and not of the dry air. There is no disclosure or suggestion to provide a **laminar airflow field** with the dry air. Therefore, both *Shibata* and *Sakai* fail to disclose or suggest all the claim limitations including the use of applying developer fluid at a **plurality of locations to controllably minimize** a subsequent sudden **change in pH**; wherein the developer fluid and the other fluid for rinsing are applied with a **low impinging force**; providing a **laminar airflow field**; a first developer fluid having a **first developer fluid chemistry**; a second developer fluid having a **second developer fluid chemistry** so as to **controllably minimize** a subsequent sudden **change in pH**; wherein the first and second developer fluid chemistries are **different**; and a rinse fluid chemistry **different** than either the first or second developer fluids.

In view of the above remarks, a specific discussion of the dependent claims is considered to be unnecessary. Therefore, Applicants' silence regarding any dependent claim is not to be interpreted as agreement with, or acquiescence to, the rejection of such claim or as waiving any argument regarding that claim. Nonetheless, the following remarks regarding the Examiner's rejections and the amended claims may be helpful to expedite prosecution.

Both *Shibata* and *Sakai* fail to disclose or suggest the rinse fluid, and the first and second developer fluids are applied with a **low impinging force**, so as to reduce damage to the patterned polymer layer and wherein the rinse fluid comprising deionized water is dispensed in a **fine disbursement**.

Applicant, accordingly, respectfully requests withdrawal of the rejection of claims 1-12 as being unpatentable over Shibata et al. (U.S. Patent No. 5,897,982), considered in view of Sakai et al. (U.S. Patent No. 5,853,961).

CONCLUSION

For the foregoing reasons, the present application is believed to be in condition for allowance, and such action is earnestly requested.

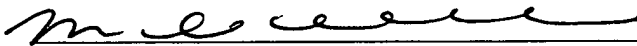
Pursuant to 37 C.F.R. 1.136(a)(3), applicant(s) hereby request and authorize the U.S. Patent and Trademark Office to (1) treat any concurrent or future reply that requires a petition for extension of time as incorporating a petition for extension of time for the appropriate length of time and (2) charge all required fees, including extension of time fees and fees under 37 C.F.R. 1.16 and 1.17, to Deposit Account No. 02-2666.

If there are any additional charges, please charge Deposit Account No. 02-2666.

Respectfully submitted,

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